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Intelligence Report

Soviet Prospects for Trade in Natural Gas with the Free World

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Soviet Prospects for Trade in Natural Gas with the Free World

Summary

By 1975 the USSR may be exporting 8 billion to 10 billion cubic meters (cu m) of natural gas annually to the Free World, if Soviet trade talks now under way with Japan, Italy, Austria, and France lead to agreements. Total Soviet trade in natural gas will be approximately in balance, as the USSR probably will be exporting about 5 billion cu m annually to the Communist countries of Eastern Europe and will be importing about 14 billion annually from Afghanistan and Iran. The imported gas, however, will be obtained at prices about half those received for the exported gas and without the expenditure of hard currency.

To achieve this level of exports, the USSR must obtain credits of about $665 million in the Free World for the purchase of large-diameter pipe and other equipment needed to construct export facilities. No significant volume of natural gas could be exported to the Free World prior to 1971, the earliest date by which proposed export facilities could be completed.

The rising Japanese demand for gas will provide a natural market for Soviet gas from reserves on Sakhalin, which are as yet undeveloped. Current negotiations may result in the export of about 2 billion cu m annually to Japan at a price of about $13.00 per thousand cu m.

Note: This report was produced by CIA. It was prepared by the Office of Economic Research; the estimates and conclusions represent the best judgment of the Directorate of Intelligence as of October 1967.

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Exports to Western Europe, which would take place through a contemplated 5,000-kilometer (km) pipeline to Trieste from the large new Soviet fields in Tyumen, could reach 6 billion to 8 billion cu m by 1975. The price of $12.36 per thousand cu m now being discussed in negotiations with Italy could cover all Soviet costs of production and transport and would be competitive with most of the gas produced in Western Europe or imported from North Africa.

The USSR is attempting to obtain credits of $180 million from Japan and $485 million in Western Europe to finance construction of export facilities. Earnings from the sale to the Free World of 8 billion to 10 billion cu m of gas per year, at prices now under discussion, could fully repay these debts within 10 years. After amortization of the foreign credits, the USSR would earn $100 million to $125 million per year from the export of gas.

The USSR, which is the only convenient market now available for natural gas from Afghanistan and Iran, has already signed agreements extending over a 15-year period to import 58 billion cu m from Afghanistan at $5.60 per thousand and 140 billion from Iran at $6.60 per thousand. The USSR is assisting with the construction of the pipelines and other facilities necessary to transmit the gas. The agreements provide that both Afghanistan and Iran will use the export revenues to repay debts for the pipelines and to finance other imports from the USSR.

Soviet Supply and Demand

1. The USSR has between one-third and one-half of the world's potential resources of natural gas and is surpassed as a producer only by the United States. (For the locations of major Soviet gas deposits, see Figure 1.) The increase in Soviet requirements since 1957 has been rapid, but growth in consumption has been held back by underfulfillment of goals for production of gas and for production of equipment to produce, transport, and consume it. Agreements recently concluded with Afghanistan and Iran provide for the first Soviet imports of natural gas. Exports have been small to date, amounting to less than a half-billion cu m annually via pipeline to Poland and, in recent months, small quantities of liquefied petroleum gas (LPG)* shipped by tanker to France. Increased exports during the next few years will depend on exploration to increase proved reserves, on production from newly discovered deposits (particularly in the Tyumen Oblast), and to some extent on the volume of imports.

2. Although there are great potential resources of natural gas in the USSR, inadequate proved reserves were a major factor in the recent lowering of the 1970 production goal from between 225 billion and 240 billion cu m to 215 billion cu m.** The Soviet and US natural gas industries usually consider proved reserves to be adequate if they are equivalent to 15 to 20 years of current production. This length of time is required for amortization of the pipelines that deliver large volumes of gas to consuming markets. Production rates in the USSR quadrupled from 1958 through 1965, but proved reserves only doubled. Thus

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* *Liquefied petroleum gas is a mixture of propane and butane obtained from oil wells or from refinery processes. LPG contains the more valuable elements of natural gas (excluding methane) and is used as a domestic and industrial fuel, as a raw material for production of chemicals, and as a blending agent in the output of petroleum products. Liquefaction can be achieved by increasing pressure alone or by pressure and refrigeration.*

** *In addition to proved reserves, there are large quantities of gas classified as probable reserves.*

proved reserves of about 1 trillion cu m at the beginning of 1959 were adequate to support 34 years of production at the 1958 rate, but proved reserves of 2 trillion cu m at the beginning of 1966 were adequate to support only about 17 years of production at the 1965 rate. Of the five principal producing areas, the Ukrainian and Azerbaydzhan SSR's and Stavropol'skiy and Krasnodar Krays in the RSFSR now have only 10- to 15-year supplies; only Uzbek SSR, with a 22-year supply, exceeds the desirable minimum. Continuation of the current trend of decreasing ratios of reserves to production will impose a constraint on future production of gas both for domestic consumption and for export (see Table 1).

3. Soviet industrial spokesmen have said that known reserves of natural gas are not adequate to provide for the needed development of the gas industry during the next few years. If economic procedures are followed in extraction from fields now producing, approximately 30 billion cu m, or nearly 15 percent, of the production now planned for 1970 must come from deposits not fully evaluated. Achievement of the original plan would have required production of 40 billion to 60 billion cu m from such deposits. The rate of additions to proved reserves has declined from an average during 1959-62 of about 230,000 cu m of gas per meter drilled to 110,000 cu m in 1965. The USSR plans to develop new deposits in Central Asia and in the Tyumen Oblast of the Urals Region, in order to meet future production goals for natural gas. Capital investment at Tyumen, however, will be greater than in the European USSR because of long supply lines, high labor turnover, and construction difficulties under subarctic conditions. The average cost of producing 1,000 cu m in the Tyumen Oblast is expected to be about 1.38 rubles, or almost three times the national average of 0.5 ruble.

4. Production of natural gas was about 143 billion cu m in 1966, 3 billion cu m short of the goal. (Annual output of natural gas, 1958-66, is shown in Table 2.) The plan to produce 215 billion cu m in 1970 (set in mid-October 1967) is more realistic than the original goal of 225 billion to

MAJOR NATURAL GAS DEPOSITS AND TRADE ROUTES OF THE USSR AND SELECTED FREE WORLD COMPETITORS

Figure 1 25X1

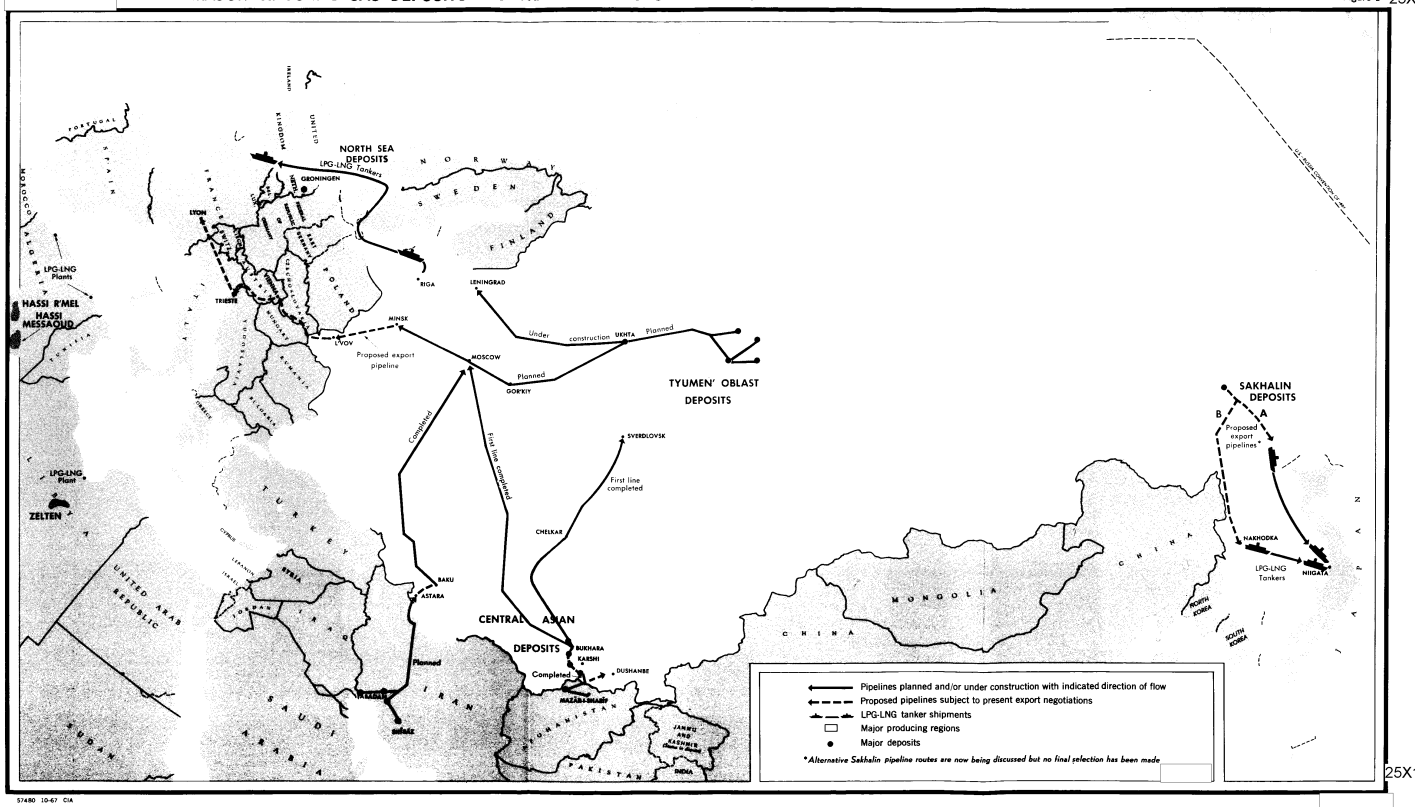

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Table 1

USSR: Ratio of Reserves to Production of Natural Gas
1958 and 1965

Area	1958 Production (Billion Cubic Meters)	Ratio of Reserves as of 1 January 1959 to the 1958 Rate of Production (in Years)		1965 Production (Billion Cubic Meters)	Ratio of Reserves as of 1 January 1966 to the 1965 Rate of Production (in Years)	
		Proved	Probable a/		Proved	Probable a/
Total USSR	28.9 b/	34	53	128.3 b/	17	29
RSFSR	13.7	39	59	59.9	16	29
Komi ASSR	1.0	13	21	0.4	22	95
Bashkir ASSR	0	0	0	1.7	5	18
Kuybyshev Oblast Orenburg Oblast	0.7	20	21	0.7	34	56
Saratov Oblast	1.9	28	30	6.4	7	12
Volgograd Oblast Astrakhan Oblast Kalmyk ASSR	2.2	31	54	5.6	16	20
	0	0	0	1.8	18	35
Rostov Oblast Krasnodar Kray Stavropol' Kray	2.0 5.9	69 38	147 45	24.6 15.4	15 13	19 16
Chechen-Ingush ASSR	0	0	0	0.3	19	29
Dagestan ASSR	0	0	0	0.3	46	165
Sakhalin Oblast	0	0	0	0.3	38	169
Tyumen Oblast	0	0	0	2.4	60	167

Table 1

USSR: Ratio of Reserves to Production of Natural Gas
1958 to 1965
(Continued)

Area	1958 Production (Billion Cubic Meters)	Ratio of Reserves as of 1 January 1959 to the 1958 Rate of Production (in Years)		1965 Production (Billion Cubic Meters)	Ratio of Reserves as of 1 January 1966 to the 1965 Rate of Production (in Years)	
		Proved	Probable a/		Proved	Probable a/
Ukrainian SSR	11.3	17	26	41.4	11	16
Azerbaydzhan SSR	3.7	19	29	3.0	11	20
Uzbek SSR	0.2	900	1,800	23.6	22	31
Turkmen SSR	0	0	0	0.1	N.A.	N.A.
Tadzhik SSR	0	0	0	0.1	23	131
Kirgiz SSR	0	0	0	0.2	19	60

a. Probable reserves include proved reserves plus additional quantities of gas that are likely to exist and be recovered.
b. The slight difference from the figure shown in Table 2 probably is due to independent rounding of regional data.

Table 2

USSR: Production of Natural Gas
1958-66

Year	Million Cubic Meters	Annual Rate of Increase (Percent)
1958	28,085	51
1959	35,391	26
1960	45,303	28
1961	58,981	30
1962	73,525	25
1963	89,832	22
1964	108,566	21
1965	127,666	18
1966	143,000	12

240 billion cu m. Attainment of the original goal was doubtful from the outset in view of past failures to achieve annual goals and the declining ratio of proved reserves to the current rate of production.

5. The failure to achieve production goals has been due largely to shortages and poor quality of producing and consuming equipment, a condition expected to persist through 1970. The USSR had only about 1,300 producing wells at the end of 1965, but 150 others were shut-in for lack of producing equipment. Although natural gas production has continued to increase each year, the rate of increase has declined since 1962 (see Table 2).

6. Consumption of natural gas rose from about 28 billion cu m in 1958 to nearly 128 billion cu m in 1965 and is expected to reach 215 billion cu m by 1970. Consumption has been restrained not only by failure to achieve goals for production of natural gas and for production of gas-producing

and consuming equipment but also by failure to lay transmission and distribution lines. It is likely, however, that during the next five to ten years some domestic gas can be made available for profitable export to high-price markets because part of the domestic need will be met by importing low-cost gas from Afghanistan and Iran.

7. Annual imports of natural gas from Afghanistan and Iran are now scheduled to reach 8 billion cu m by 1970 and about 14 billion by 1975. During most of the period 1967-75, imports probably will exceed total Soviet exports of natural gas, and by 1975 trade will be approximately in balance. (Estimated imports and exports during 1966-75 are shown in Figure 2.)

8. Deliveries from Afghanistan were scheduled to begin with 0.7 billion cu m during the last half of 1967. The annual rate of delivery is to increase gradually to 2 billion cu m in 1970, 3.5 billion in 1973, and 4 billion during 1976-84. The USSR, which is the only market available to Afghanistan, has agreed to import a total of nearly 58 billion cu m of gas at the low price of $5.60 per thousand cu m.* The total gross revenue of about $323 million will be used in part by Afghanistan to repay a Soviet loan of $39 million extended to cover the development of natural gas production and pipeline transmission facilities. The balance of Afghanistan's revenue from this agreement will be used to repay other outstanding loans from the USSR. Delivery of the natural gas will be made through a 32-inch pipeline from Shibarghan in Afghanistan to Mubarek in Uzbek SSR, a distance of about 350 km. Later, the import line may be connected with the Central Asian system that supplies gas to the Urals and the Central Industrial Region.

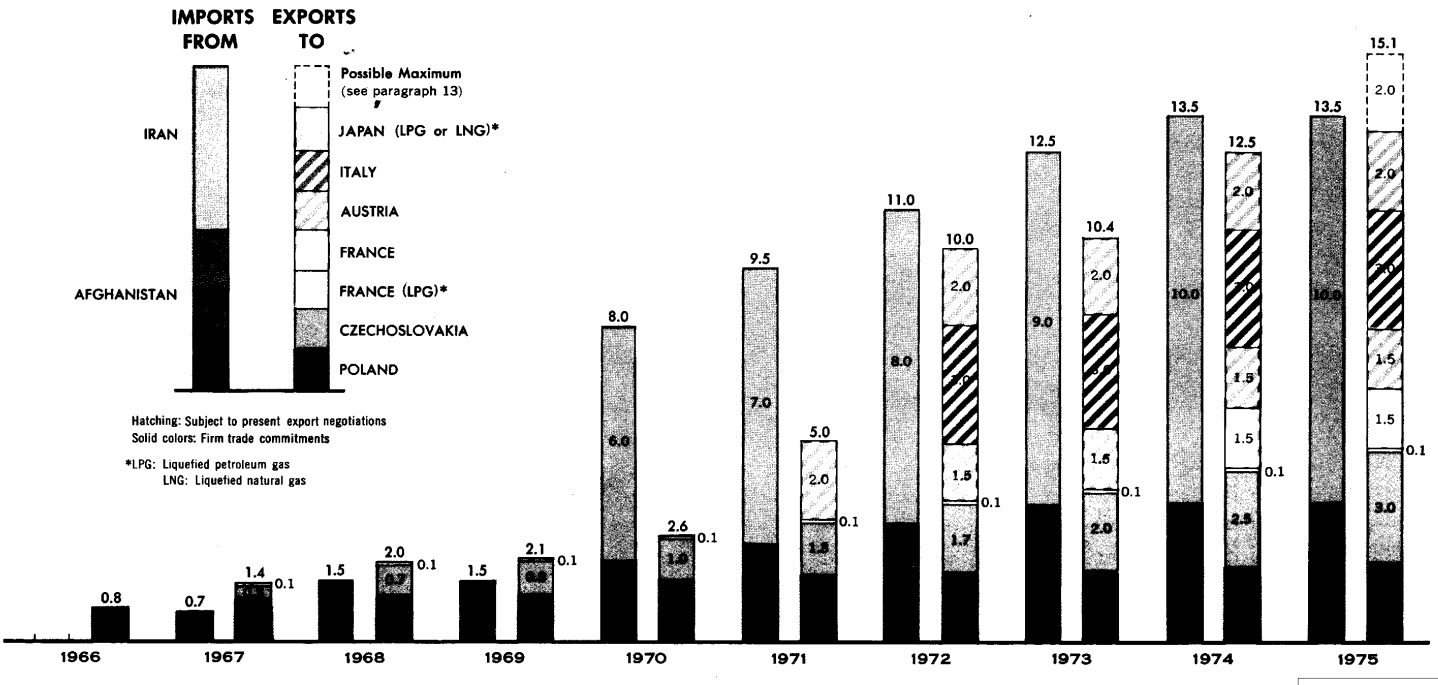
9. Under agreements signed in 1966 and 1967, the USSR will import about 140 billion cu m of natural gas from Iran over a 15-year period. Deliveries will commence at the rate of 6 billion cu m annually in 1970, will increase to 10 billion

* *All prices for natural gas shipments in this report refer to delivered prices, unless otherwise indicated.*

Figure 2

USSR: ESTIMATED FOREIGN TRADE IN NATURAL GAS, 1966-75

(Billion Cubic Meters)



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by 1974, and will remain at this level until 1985. The Iranian gas is produced in association with the extraction of crude oil in Iran and would otherwise be burned as waste. Because there is no other ready market for the gas, it will be sold at the low price of $6.60 per thousand cu m. The total revenue of about $1 billion accruing to Iran will be used to pay for a gas pipeline and for other imports from the USSR, including a steel mill complex, a heavy machinery plant, and military equipment valued at $110 million. Deliveries to the USSR will be made through a 40-inch pipeline, to be built with Soviet technical assistance, that will extend for 1,300 km from the southern Iranian oil and gas fields of Agha-Jari and Gach-Saran to Astara in Azerbaydzhan SSR. The gas will be used in Azerbaydzhan to supplement local supplies from reservoirs that are becoming depleted. Imported Iranian gas in excess of local demand in Azerbaydzhan may eventually enter the gas pipeline network at Stavropol', thus providing greater flexibility to the Soviet distribution system. It may also free more expensive gas produced elsewhere in the Soviet Union for export to Western Europe, where prices are relatively high.

Potential Foreign Markets

10. Japan and the industrialized countries of Western Europe represent potential markets for Soviet gas because of their growing requirements for energy and their limited domestic resources. Discussions concerning sales of Soviet gas to some of these countries were under way in mid-1967. No significant volumes of Soviet natural gas will be exported to Free World countries prior to 1971, however, as the necessary export facilities could not be completed before 1970 -- even if agreements were reached this year* (see Figure 1).

11. Demand for natural gas in Japan is expected to increase by 10 percent annually, from about

* *In addition to exports to Free World markets, the USSR will supply about 1.5 billion cu m of gas annually to Poland and 1 billion annually to Czechoslovakia by 1970. By 1975, exports to these Communist countries could total 5 billion cu m annually.*

2 billion cu m in 1965 to more than 5 billion cu m in 1975. All gas consumed to date has been produced domestically, but reserves will no longer support production at the rate necessary to satisfy future demand. An agreement was concluded early in 1967 with US companies to supply Japan with slightly more than 1 billion cu m per year of liquefied natural gas (LNG)* from Alaska during 1969-84 at a delivered price of about $18.35 per thousand cu m. The hitherto undeveloped gas deposits on Sakhalin represent a logical source of supply for Japan's growing needs, and a trade agreement now being negotiated with the USSR would provide Japan with about 2 billion cu m annually of LNG or perhaps LPG, beginning about 1971. Negotiations currently are stalled on price and on terms of credits of more than $180 million that Japan will extend to the USSR for two processing plants, two tankers, pipe, and related equipment that will be required for exploitation of the Sakhalin gas deposits. Soviet negotiators have been insisting on a 5½-percent rate of interest, whereas the Japanese have sought a 7-percent rate. Amortization of the credit in eight to nine years, with a three-year grace period, has been proposed by the Japanese. Agreement probably will be reached on a price of about $13.00 per thousand cu m. Conclusion of the agreement appears almost certain in view of the lack of alternative sources of gas to satisfy rising Japanese demand and the lack of alternative markets for Soviet gas from Sakhalin.

12. Consumption of natural gas in Western Europe was about 20 billion cu m in 1965 and is expected to reach 53 billion in 1970 and about 113 billion in 1975.** The share of natural gas in the total energy balance, which was about

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* *Liquefied natural gas is principally methane obtained in natural gas streams. It is used primarily as a fuel for domestic heating. Liquefaction is achieved by a combination of pressure and refrigeration.*

** *These figures refer to natural gas containing about 8,000 or 9,000 kilocalories per cubic meter (Kcal/cu m). Larger demand figures published in some European literature refer to gas containing about 4,000 to 4,500 Kcal/cu m, the norm for manufactured gas.*

3.3 percent in 1964, is expected to be about 7 percent in 1970 and 10 percent in 1975. Production of natural gas in Western Europe will not be sufficient to satisfy anticipated demand, unless the Netherlands revises its present policy that limits output from the large Groningen deposits and restricts exports to no more than 50 percent of production. Total output of gas in Western Europe is expected to reach only 45 billion cu m by 1970 and about 93 billion by 1975, and imports of 8 billion cu m in 1970 and 20 billion in 1975 will be required. Under present agreements, North Africa will supply the 8 billion cu m required in 1970. The planned expansion of North African export facilities will permit shipments to Western Europe to increase to about 14 billion cu m by 1975. (The estimated supply and demand of individual Western European countries in 1964, 1970, and 1975 is presented in Table 3.)

13. Prospects for exports of Soviet natural gas to Western Europe after 1970 are subject to the outcome of current negotiations with Italy, Austria, and France and to the ability of the USSR to meet its own rising domestic requirements. Unless exploratory drilling is markedly more successful than it has been in recent years, the quantities of gas available for export will remain small. The USSR is also seeking substantial credits in the Free World for construction of the necessary pipeline and other export facilities. Finally, competition with gas from North Africa and possibly from the Netherlands and the North Sea may hold demand for Soviet gas in Western Europe to about 6 billion to 8 billion cu m by 1975. Soviet exports to Western Europe in 1975 may be distributed approximately as follows:

	Billion Cubic Meters
Italy	3 to 4
Austria	1.5 to 2
France	1.5 to 2
Total	6 to 8

Table 3

Western Europe: Estimated Supply and Demand of Principal Consumers of Natural Gas
1964, 1970, and 1975

Country	1964		1970				1975			
			Billion Cubic Meters				Billion Cubic Meters			
	Production (Billion Cubic Meters)	Natural Gas as a Percent of Total Energy	Production	Trade (+Imports -Exports)	Demand	Natural Gas as a Percent of Total Energy	Production	Trade (+Imports -Exports)	Demand	Natural Gas as a Percent of Total Energy
Italy	7.6	10.1	7	+3	10	10	7	+6 to 7	13 to 14	11
Austria	1.9	12.3	1.5	0	1.5	10	0 to 1	+1 to 3	2 to 3	10
France	5.2 a/	4.4	5	+5	10	6.7	5 to 6	+10 to 11	16	9
Germany	2.3	1.1	3	+7	10	4	10	+10	20	8
Netherlands	0.9	2.2	24	-12	12	16	40	-20	20	33
Belgium	0	0	0	+3	3	4	0	+ 5	5	9
Spain	0	0	0	+1	1	N.A.	0	+ 5	5	N.A.
United Kingdom	0.3 a/	0.1	4	+1	5	5	30 b/	+ 1	31 b/	10
Total c/	18.2 a/	3.3	45	+8	53	7	93	+20	113	10

a. In addition, small quantities of Algerian LPG were imported beginning late in 1964.
b. Although the North Sea deposits are now considered large enough to support annual production rates of 30 billion to 40 billion cu m by 1975, the difficulties involved in offshore operations may necessitate a longer startup period.
c. Because of rounding, production and trade components may not add to the totals shown. Totals for production, trade, and demand in 1975 are the midpoints of ranges obtained by adding the data for the individual countries.

14. Italian demand for natural gas is expected to increase from 8 billion cu m in 1966 to 10 billion in 1970 and to 13 billion to 14 billion in 1975. Po Valley gas deposits are expected to be depleted by about 1975, but development of other deposits will enable the Italians to maintain production at the rate of 7 billion cu m per year, at least through 1975. A contract has already been concluded for imports from Libya of up to 3 billion cu m of gas per year in the form of LPG. Additional imports of approximately 3 billion to 4 billion cu m annually will be needed by 1975 and could result from negotiations currently in progress between Italy and the USSR. Alternative sources of supply for Italy would arise if there is successful exploration and exploitation of recently discovered gas deposits offshore in the Adriatic and off the Libyan coast.

15. Austrian demand for natural gas is expected to be 2 billion to 3 billion cu m per year in 1975. Current demand for 1.5 billion cu m is satisfied by domestic production, but reserves are nearly depleted and imports will be necessary to supply even preferred industrial users by 1975. Austria has been unsuccessful in previous attempts to secure natural gas from the USSR because Ukrainian production was inadequate to support exports beyond those committed to Czechoslovakia and Poland. Within the next 10 years, however, Soviet gas will become available in Tyumen. Extension to Austria of the "Brotherhood" gas pipeline that now links the Ukraine to Bratislava in Czechoslovakia would provide a way of transporting the 1.5 billion to 2 billion cu m of gas that Austria might import annually by 1975. Alternatively, Austria could import Soviet gas as a participant in a system designed to transport gas from the USSR to Italy.

16. French demand for gas by 1975 has been estimated at 13 billion to 16 billion cu m annually by the Chairman of the Board of Gaz de France, the government-controlled gas monopoly. Domestic production of natural gas has been about 5 billion cu m annually for several years and is not expected to exceed 5 billion to 6 billion cu m through 1975. At that time, approximately 5 billion cu m

per year will be imported via pipeline from the Netherlands and about 4 billion cu m per year in LPG tankers from Algeria. France has signed an agreement to purchase annually from the USSR 100,000 tons* of LPG, an amount equal to about 130 million cu m of natural gas. The reported price is $14.47 to $14.83 per thousand cu m. Shipments will begin in 1967 by tanker from new liquefaction facilities located at Riga on the Baltic Sea. The French are considering imports of 1.5 billion to 2 billion cu m of gas per year from the USSR, contingent on a pipeline extending from the USSR to Austria and Italy and then to France. French interest in imports from the USSR may have abated somewhat as a result of the recent agreement to import 4 billion cu m of gas from Algeria, 1.5 billion to 2 billion cu m more than had been foreseen earlier.

Soviet Ability to Compete

17. Natural gas will be available in quantity to Western Europe from several sources of supply: the vast Groningen deposits in the Netherlands; offshore deposits in the North, Adriatic, and Mediterranean Seas; and deposits in Libya and Algeria. Gas from these sources may even create a buyers' market for natural gas in Western Europe by 1975. Soviet natural gas could enter the Western European market only if it is available at attractive prices and if a large-diameter pipeline is constructed from the natural gas fields in Tyumen Oblast to the western USSR and to Western Europe.

18. A 5,000-km large-diameter pipeline from Tyumen to Trieste has been proposed for transporting Soviet natural gas to Western Europe, but it could not be completed until some time after 1971. Plans exist for construction of a multistrand pipeline system that will supply gas from the Tyumen fields to Leningrad and the Northwest Region, to the Central Region and Minsk, and to the North Urals industrial region. The first phase of this system could be extended to Western Europe, on a priority basis, and could earn foreign exchange

* *Tonnages are given in metric tons.*

to finance later phases of the domestic pipeline facilities. A 48-inch line from Tyumen to Minsk and a 40-inch line from Minsk to Trieste would permit movement of gas from the Tyumen deposits to consumers in the western USSR and would make possible delivery of up to 10 billion cu m of gas annually to markets in Western Europe.

19. It is estimated that the single line from Tyumen to Trieste would cost between $1.1 billion and $1.3 billion and would require 1.6 million tons of large-diameter pipe. Construction of the section from Minsk to Trieste, which would extend the line into Western Europe, will depend on the availability of large-diameter pipe and on the ability of the USSR to secure long-term credits of up to $485 million to finance the purchase of pipe and other equipment. Domestic pipeline systems will probably absorb all the large-diameter pipe produced in the USSR, and extension of an export line to Trieste would require import of pipe. Western manufacturers such as Germany's Mannesmann and Thyssen, Austria's Voest, and Italy's Finsider would be the most probable sources of pipe. Italy, however, may be reluctant to extend another large long-term credit to the USSR so soon after the $400 million Fiat and Olivetti agreements. Moreover, nearly all West German, French, and British pipe manufacturers have full order books for the period up to 1970 as a result of the development of the vast Groningen deposits in the Netherlands. After 1970, pipe manufacturing capacity may be available for other projects and Soviet orders may then be welcomed.

20. Current Soviet-Italian trade negotiations are stalled on the question of a price for Soviet natural gas to be delivered via pipeline to a terminal near Trieste. A price of $12.36 per thousand cu m has been mentioned most frequently in press reports. If this is agreed on, Soviet gas would be competitive with gas from North Africa and the Netherlands and with gas produced domestically in Italy. North African LPG-LNG tanker deliveries to Italy were valued at $14.36 to $15.08 per thousand cu m during recent negotiations. Under present Dutch export policy, gas is expected to cross the Netherlands border at a minimum price

of $13.00 per thousand cu m. Present prices for natural gas produced in Italy range from an average of $11.20 per thousand cu m for gas sold to favored users such as the chemical industry to $16.00 for gas sold to other consumers.

21. Soviet trade journals indicate that production costs for Soviet natural gas average about $0.56 per thousand cu m on a nationwide basis. The cost of producing gas from fields in the Tyumen Oblast, however, is about $1.50 per thousand cu m, or nearly three times the national average. The cost of moving 1,000 cu m of gas through a 3,500-km 48-inch pipeline from fields in the Tyumen Oblast to Minsk would be about $4.90, and the additional cost for transmitting the gas through a 40-inch line over the remaining 1,500 km from Minsk to Trieste would be about $4.10. Thus the total delivered cost at Trieste would be about $10.50, and the reported price of $12.36 per thousand cu m of Soviet gas would more than cover the costs of production and transmission if a 48-inch pipe were laid between Tyumen and Minsk.

Debt Retirement and Estimated Foreign Exchange Earnings

22. The USSR probably would retire as quickly as possible any foreign obligations incurred to finance part of the construction of a pipeline to Western Europe. At a price of $12.36 per thousand cu m of gas, a foreign credit of $485 million at 6 percent interest could be completely amortized in nine years with annual exports of 6 billion cu m or in six years with annual exports of 8 billion cu m. Such rapid retirement of the foreign credit would, however, defer profits and amortization of domestic costs. After repayment of the debt, a price of $12.36 per thousand cu m would yield the USSR an annual return of $74 million with exports of 6 billion cu m and about $99 million with exports of 8 billion cu m. A Japanese credit of $180 million at 6 percent interest could be completely repaid in 10 years with exports of 2 billion cu m per year at a price of $13.00 per

thousand cu m*; after repayment of the debt, annual earnings would be $26 million per year.

23. With exports of 6 billion to 8 billion cu m to Western Europe and 2 billion cu m to Japan, the USSR could repay all of its debts for export facilities within nine or ten years. Foreign exchange earnings after repayment of the debts would amount to $100 million to $125 million per year, depending on whether Western Europe buys 6 billion or 8 billion cu m annually. Because the 40-inch line to Trieste would be capable of carrying up to 10 billion cu m annually, the USSR might earn as much as $150 million per year if the additional gas could be marketed at the same price. It is probable, however, that new discoveries of gas in the Free World will force the USSR to lower its price for any additional gas that it wishes to sell in the European market.

* *Amortization within nine years would be possible if Soviet negotiators are successful in getting agreement on the 5½-percent rate of interest that they have sought.*

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